

**BIOGRAPHICAL SKETCH**

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NAME: Buttrick, Peter M.

eRA COMMONS USER NAME (credential, e.g., agency login): Buttrick

POSITION TITLE: Professor of Medicine, Physiology and Biophysics

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.*)

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Haverford College, Haverford, PA	BA	1974	Biology/Philosophy
SUNY @ Stony Brook, Stony Brook, NY	MD	1979	Medicine

**A. PERSONAL STATEMENT**

Dr. Buttrick has a long history and commitment to education and mentorship. He has directed cardiology fellowship training programs at three academic centers, and he has directed two T32 programs. (He assumed co-directorship of the Colorado program in 2009) He is co-PI of a recently funded R38 program focused on the training of physician-scientists. He also was overall project leader and training program director of an AHA SFRN focused on heart failure. He has chaired the NIH study section that reviews training grants. In addition to his personal commitment to mentorship, by virtue of his campus-wide leadership positions, he is well-positioned to identify and to create multi-disciplinary training opportunities that take advantage of the rich academic environment at the University of Colorado. His laboratory work has focused on cardiac myocyte biochemistry and mechanics in both animal models of heart disease and in humans. Studies have been conducted at the single cell and myofibril level as well as at the level of the whole heart. A major interest has been correlating both changes in gene expression and in post-translational sarcomeric protein modifications with mechanical measurements with the thought that this approach can identify putative therapeutic targets. Recent work has focused on identifying chamber specific modifications in cell structure and function in response to pathologic stimuli.

Ongoing and recently completed projects that I would like to highlight

T32 HL007822, Buttrick PI 7/1/09 – 6/30/24  
NIH/NHLBI  
Post graduate studies in cardiovascular research  
This training grant provides salary support to 5 post-docs pursuing careers in cardiovascular research

R38 H143511-01 Schwartz, PI, Buttrick co-PI 2/14/20 – 2/13/25  
NIH/NHLBI  
Colorado StARR Program in Medicine and Pediatrics (CSPMP)  
This grant is to identify and train promising early career physician scientists with a focus in cardiology and pulmonary medicine

Strategic Focused Research Network, Buttrick, project lead and director of training 7/1/16 - 6/30/21  
American Heart Association  
This multi-investigator program investigated basic, clinical and population based questions linked to dilated cardiomyopathy and heart failure

This grant will explore novel strategies for cardiac muscle repair targeting fibroblast lineage determination both in rodents and in large animal models

#### Recent citations

- a. G.Michael Felker, Peter Buttrick, Anthony Rosenzweig, E. Dale Abel, Larry A. Allen, Michael Bristow, Saumya Das, Adam D. DeVore, Stavros G. Drakos, James C. Fang, Jane E. Freedman, Adrian F. Hernandez, Dean Y. Li, Timothy A. McKinsey, Christopher Newton-Cheh, Joseph G. Rogers, Ravi V. Shah, Svati H. Shah, Josef Stehlik, Craig H. Selzman. Heart Failure Strategically Focused Research Network: Summary of Results and Future Directions. *J Am Heart Assoc*; 11(18): e025517, 2022. PMID: 9683647
- b. Allen LA, Venechuk G, McIlvennan CK, Page li RL, Knoepke CE, Helmkamp LJ, Khazanie P, Peterson PN, Pierce K, Harger G, Thompson JS, Dow TJ, Richards L, Huang J, Strader JR, Trinkley KE, Kao DP, Magid DJ, Buttrick P, Matlock DD. An Electronically Delivered, Patient-Activation Tool for Intensification of Medications for Chronic Heart Failure with Reduced Ejection Fraction: The EPIC-HF Trial. *Circulation*. 143(5): 427–437. 2022. PMID: 33201741.
- c. Andrew S. Riching, Etienne Danis, Yuanbiao Zhao, Yingqiong Cao, Congwu Chi, Rushita A. Bagchi, Brianna J. Klein, Hongyan Xu, Tatiana G. Kutateladze, Timothy A. McKinsey, Peter M. Buttrick, Kunhua Song. Suppression of canonical TGF- $\beta$  signaling enables GATA4 to interact with H3K27me3 demethylase JMJD3 to promote cardiomyogenesis. *J Mol Cell Cardiol*. 153: 44–59. 2021 PMID: PMC8809092
- d. Cornwell WK, Tran T, Cerbin L, Coe G, Muralidhar A, Hunter K, Altman N, Ambardekar AV, Tompkins C, Zipse M, Schulte M, O'Gea K, Ostertag M, Hoffman J, Pal JD, Lawley JS, Levine BD, Wolfel E, Kohrt WM, Buttrick P. New insights into resting and exertional right ventricular performance in the healthy heart through real-time pressure-volume analysis. *J Physiol*. 598(13):2575-258, 2020. PMID: 32347547.

## B. POSITIONS AND HONORS

### Positions and Employment

1979-1982	Intern/Resident, Internal Medicine, Michael Reese Hospital, Chicago, Ill
1982-1983	Research Fellow in Cardiology, Montefiore Med Center, Einstein College of Medicine, Bronx NY
1983-1985	Clinical Fellow in Cardiology, Montefiore Med Center, Albert Einstein College of Medicine
1985-1997	Albert Einstein College of Medicine: Assistant Professor of Medicine (1985-1990), Assistant Professor of Physiology and Biophysics (1988-1997), Associate Professor of Medicine and Physiology (1990-1995), Professor of Medicine (1995-1997)
1991-1997	Director, Cardiology Fellowship Programs, Einstein College of Medicine/Montefiore Med Center
1997-2006	Professor of Medicine and Physiology (with tenure) and Chief, Section of Cardiology, University of Illinois at Chicago
1997-2006	Co-director, Center for Cardiovascular Research, University of Illinois at Chicago
2006-2022	S. Gilbert Blount Professor of Medicine and Physiology (tenure) and Head, Division of Cardiology, University of Colorado, Denver
2010 -	Co-director (with Dr. Leslie Leinwand) of the CU CVI
2015 -	Senior Associate Dean for Academic (Research) Affairs, University of Colorado, Denver

### Other Experience and Professional Memberships

1993-1997	New York Heart Association - Peer Review Committee, Co-chair/Chair (1996-1997)
1994	NIH: Clinical Sciences II Study Section, Ad hoc member
1995-1996	NIH: SCOR grants and RAP Study Section, Ad hoc reviewer
1995-1998	VA Merit Award Review Committee, member and Chair (1997-1998)

1997-2001 NIH: RAP Regular Study Section member  
 2002-2008 NIH: CCVS / CICS/ZRG1F10 Study Section, Regular member and Chair 2006-2008  
 2004-2010 NIH: RIRG-G (PO1) Regular study section (parent committee) member  
 2011- Ad hoc member of multiple NIH study sections, including MIM and RIRG  
 1999-2002 Editorial Board, *Journal of Applied Physiology*  
 2004- Editorial Board, *Journal of Molecular and Cellular Cardiology*  
 2004-2011 Editorial Board, *American Journal of Physiology, Heart and Circulatory Physiology*  
 1999- Associate Editor, *Heart Disease*  
 2015 - 2021 Associate Editor, *Journal of Cardiac Failure*

## Honors

1984-1985 Merck-American College of Cardiology, Research Fellowship Award  
 1985-1990 NIH-Clinical Investigator Award  
 1997 Association of Professors of Cardiology; Counselor 2010; President 2012  
 1998 Association of University Cardiologists (elected member), President 2012  
 2009 American Association of Physicians (elected member)

## C. CONTRIBUTIONS TO SCIENCE (selected from a total of >150 peer reviewed and invited articles)

1. Our lab has contributed to understanding the molecular and biochemical plasticity of cardiac muscle in response to external stresses, such as pressure overload, myocardial infarction and diabetes.
  - a. Jweid E, Walker L, McKinney R, Geha AS, Massad M, Buttrick PM, deTombe PP. Depressed cardiac myofilament function in human diabetes mellitus. *Amer J Physiol*, 289: 2478-83, 2005. PMID 16085678.
  - b. Hankiewicz J, Goldspink PH, Buttrick PM, Lewandowski ED. Principal strain changes precede ventricular wall thinning during transition to heart failure in a mouse model of dilated cardiomyopathy. *Amer J Physiol*, 294: H330-6, 2008. PMID 17965277.
  - c. Goldspink PH, Ruch S, Los T, Buttrick PM, Garcia J. Maladaptation of calcium homeostasis in aging cardiac myocytes. *Pflugers Archives*, 456: 479-87, 2008. PMID 18172603.
  - d. Scruggs SB, Hinken AL, Walker LA, Robbins J, deTombe PP, Geenen DL, Buttrick PM, Solaro RJ. Ablation of Ventricular Myosin Regulatory Light Chain Phosphorylation in Mice Causes Contractive Dysfunction in vivo and Affects Neighboring Myofilament Protein Phosphorylation, *J Biol Chem*. 284: 5097-106, 2009. PMID 19106098.
  
2. As part of this investigation, we have developed novel tools and analytic strategies
  - a. Xiao L\*, Zhao Q\*, Du Y, Yuan C, Solaro RJ, Buttrick PM. PKC Epsilon increases phosphorylation of the cardiac Myosin Binding Protein C at Serine 302 both in vitro and in vivo. *Biochemistry*, 46: 7054-61, 2007. PMID 17503784.
  - b. Scruggs SB, Reisdorph N, Reisdorph R, Solaro RJ, Buttrick PM. A novel in-solution separation of endogenous sarcomeric proteins and identification of distinct charged variants of regulatory light chains. *Mol Cell Proteomics*, 9: 1804-18, 2010. PMID 20445002.
  - c. Thoemmes SF, Stutzke CA, Du Y, Browning MD, Buttrick PM, Walker LA. Characterization and Validation of New Tools for Measuring Site-Specific Cardiac Troponin I Phosphorylation. *J Immunol Methods* 403: 66-71, 2014.
  - d. Zhao Y, Londono P, Cao Y, Sharpe EJ, Proenza C, O'Rourke R, Jones KL, Jeong MY, Walker LA, Buttrick PM, McKinsey TA, Song K High-efficiency reprogramming of fibroblasts into cardiomyocytes requires suppression of pro-fibrotic signalling. *Nat Commun*. 2015 6:8243. PMID: 26354680
  
3. We have attempted to translate findings in animal models of disease into human contexts, taking advantage of human biopsy material
  - a. Lowes B, Buttrick PM. Genetic determinants of drug response in heart failure. *Curr Cardiol Rep*. 10: 176-81, 2008. PMID 18489860.

- b. Walker LA, Cleveland J, Walker JS, Buttrick PM. Tissue Procurement Strategies Affect the Protein Biochemistry of Human Heart Specimens. *Journal of Muscle Research and Cell Motility*, 31: 309-14, 2011. PMID 21184256.
  - c. Walker LA, Fullerton D, Buttrick PM. Contractile Protein Phosphorylation Predicts Human Heart Disease Phenotypes. *American Journal of Physiology: Heart and Circulatory Physiology*, Amer J Physiol 304:H1644-50, 2013. PMID 23564307
  - d. Ambardekar A, Walker LA, Walker JS, Lowes BD, Cleveland J, Buttrick PM. Left Ventricular Assist Device Support Improves Myocardial Architecture and Results in Partial Recovery of Organ and Myocyte Contractile Function. *Circulation: Heart Failure*, 4: 425-32, 2011 PMID 21540356.
4. More recently, our focus has been on the characteristics that distinguish right and left sided heart failure.
- a. Cavasin M, Demos-Davies K, Horn TR, Walker LA, Lemon DD, Birdsey N, Weiser-Evans MC, Harral J, Irwin DC, Anwar A, Yeager ME, Li M, Watson PA, Nemenoff RA, Buttrick PM, Stenmark KR, McKinsey TA. Selective Class I HDAC Inhibition Suppresses Hypoxia-Induced Cardiopulmonary Remodeling Through an Anti-Proliferative Mechanism, *Circulation Research* 110: 739-748, 2012. PMID 22282194.
  - b. Walker LA, Walker JS, Glazier AA, Brown D, Stenmark K, Buttrick PM. Biochemical and Myofilament Responses of the Right Ventricle to Severe Pulmonary Hypertension. *American Journal of Physiology*, 301: H832-40, 2011.
  - c. Bruns DR, Brown RD, Stenmark KR, Buttrick PM, Walker LA. Mitochondrial integrity in a neonatal bovine model of right ventricular dysfunction. *Am J Physiol Lung Cell Mol Physiol*. L158-67, 2015 PMID: 25416385
  - d. Bruns DR, Tatman PD, Kalkur RS, Brown RD, Stenmark KR, Buttrick PM, Walker LA.. The right ventricular fibroblast secretome drives cardiomyocyte dedifferentiation. *PLoS One*. e0220573.2019.PMID: 31374110

Complete List of Published Work in My Bibliography

<https://www.ncbi.nlm.nih.gov/pubmed/?term=buttrick+p&p%24a=&p%24l=DefaultSite&p%24st=defaultsite>